

ELECTRIFICATION STUDY

Workshop Summary Report Stakeholder Workshop #2

June 15, 2010

Prepared by:
Lura Consulting
Toronto, ON



This workshop summary report was prepared by Lura Consulting. Lura is providing third party facilitation services as part of the GO Transit Electrification Study. This summary report captures the key discussion points raised during Stakeholder Workshop #2. It is not intended as a verbatim transcript of comments received. If you have any questions or comments regarding the summary, please contact:

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1 About Stakeholder Workshop #2

Metrolinx has initiated a study of the electrification of the entire GO Transit rail system as a future alternative to diesel trains now in service. The electrification study is examining how the future GO rail services will be powered – using electricity, enhanced diesel technology or other means – when these services are implemented in the future. The study will assess the benefits and costs of a full range of technology options, including enhanced diesel, electric and alternative technologies. The study is considering the existing GO Transit network, proposed network expansions, as well as the future Pearson Air Rail Link.

On Thursday, May 27th, 2010 the Electrification Study Team hosted the second stakeholder workshop for organizations across the Greater Toronto and Hamilton Area (GTHA). The workshop took place between 6:30 – 9:00 p.m. at Metro Hall in downtown Toronto.

1.1 Purpose

The workshop was designed to provide participants with an update on the Electrification Study progress and obtain feedback on the work completed to date. Specifically, the session examined the rolling stock technology and network options for the GO network and the proposed approach for the further assessment of options.

1.2 Attendance

In total, 19 representatives of non-governmental organizations registered for the workshop, with 11 attending the June 15th session. A list of organizations invited to participate in the workshop, as well as those who attended the meeting, is included in Appendix F.

1.3 Format

The workshop was facilitated by Mr. Jim Faught of Lura Consulting. At 6:30 p.m., Mr. Faught welcomed the participants to the workshop, described the session's purpose, and introduced key representatives from Metrolinx and the Delcan+Arup JV Study Team.

The workshop began with opening remarks from Ms. Leslie Woo, Vice President of Policy and Planning, Metrolinx, who thanked participants for their interest and participation in the Electrification Study. Ms. Karen Pitre, Study Project Director, Metrolinx, then provided a recap of the previous stakeholder workshop and an update on progress completed since that meeting.

Next, Mr. Roger Wood, Study Project Manager, Delcan+Arup JV Study Team, provided stakeholders with an overview of the reference case used in the Electrification Study and the technology alternatives rolling stock available for the GO network. Mr. Wood then discussed the preliminary network options based on the alternative rolling stock technologies and the

pre-screening criteria proposed for the further assessment of options. The presentation was supplemented with PowerPoint slides that can be found in Appendix A. After the presentation, meeting attendees were invited to ask questions and provide comments. A more detailed account of the questions and comments from the meeting can be found in Appendix B.

Following the question and answer period, workshop attendees engaged in a plenary discussion about rolling stock technology assessment and network options (Working Session #1). As a group, participants discussed the questions outlined on the workshop worksheet (see Appendix C for a sample worksheet). Afterward, participants were divided into two breakout groups to discuss the proposed approach for further assessment of options (Working Session #2). The breakout groups were encouraged to capture their ideas in writing so that they could be accurately recorded and included in this workshop report. The groups were given 30 minutes to discuss the question for Working Session #2 and then share their feedback with the other workshop participants and the Electrification Study Team.

2 Summary of Comments Received

The following section provides a summary of the comments received from workshop participants. A more detailed account of the question and answer period can be found in Appendix B. In addition, comments received during the workshop discussion periods and from worksheets submitted following the session can be found in Appendix D and E respectively.

2.1 Study Approach

- Compliments were given to the Study Team for the quality of the draft rolling stock technology assessment distributed prior to the workshop and participants indicated that they were eager to obtain additional study outputs and reports
- Stakeholders requested that more information be provided about the decision-making framework for implementing the findings and conclusions of the Electrification Study
- The Georgetown line should be included in the reference case as a line with GO service on the half hour
- The study should look beyond 2021 when calculating the social, environmental, and financial costs and benefits associated with electrifying the GO network

2.2 Rolling Stock Technology Assessment and Network Options

2.2.1 Assessment of the Rolling Stock Technologies

- The cost of converting existing rolling stock to Tier 4 technology should be included in the assessment of rolling stock technology options
- What if a prototype for converting the existing rolling stock to Tier 4 technology (as well as cost information) is not available by the time the study is complete?

- The study should use both Tier 2 and Tier 4 technology as the starting points for comparing the rolling stock technology and network options
- Return on investment calculations done for the technology options should be extended past 2021
- Technology options must accommodate service expansion past 2021
- The Study Team should look at other options beyond running just 12 car consists on all lines at all times

2.2.2 Network Options

- The Study Team should examine the viability of a phased implementation plan for electrification (e.g. utilizing electrified lines to the outskirts of the city, then operating diesel technology to periphery stations)
- The study should consider the formation of other network hubs (e.g. Bloor Subway Line) that could reduce constraints associated with Union Station capacity
- Future station stops (e.g. Weston, Bloor) should be included in the analysis of available network options for 2021
- If more than one technology is used on the GO network, will additional storage and maintenance facilities need to be constructed?

2.3 Proposed Approach for Further Assessment of Options

2.3.1 Screening Approach

- Stakeholders requested that the assumptions used in the preliminary screening of rolling stock technology and network options be published for review and comment
- Details should be given to stakeholders about how the evaluation criteria will be weighted and prioritized during the screening process

2.3.2 Screening Criteria and Comparison

- The study team should examine the impacts that each technology option has on land use across the GTHA (e.g. encourage economic development and implement regional planning policies)
 - Priority should be given to options that increase user benefits and result in positive social impacts (e.g. ability of technology options to encourage individual modal shifts, reduction of trip times)
 - Sensitivity analysis should be conducted to account for rising energy costs past 2021
 - Consider the health effects of each option on communities within the GTHA
 - Include the health and environmental costs resulting from GHG emissions in the analysis of technology and network options
 - Sustainable energy sources should be prioritized during the assessment of options
 - Would an electrified network improve service levels and better enable GO transit to achieve service targets (e.g. reduced trip time, increased capacity, etc.)?
-

2.4 General Comments

2.4.1 Operations and Planning

- More reverse peak service is needed to encourage growth in suburban downtowns and employment centres
- The 'Big Move' needs to be revised so that Metrolinx can work toward achievable infrastructure targets

2.4.2 Air Rail Link (ARL)

- The Electrification Study Team needs more details about the ARL to ensure it is adequately addressed in this study
- The ARL project team should begin to dialogue with stakeholders
- The ARL must be electrified

3 Next Steps

The next steps for the study, as presented by Mr. Roger Wood of the Delcan+Arup JV Study Team, include:

- Further refining of the technology and network options screening process
- Continued evaluation of the rolling stock technology and network options
- Additional consultation with stakeholders at the upcoming stakeholder and geographic-based workshops
- Obtaining feedback from the broader public through e-consultation in the near future

Mr. Faught thanked participants for their participation and feedback at the workshop. He also noted that the Electrification Study Website was updated prior to the second stakeholder workshop and encouraged stakeholders to visit the website for further information.

APPENDIX A:

Workshop Presentation




METROLINX
**Electrification of the GO Transit
 Rail Network**

Stakeholder Workshop # 2


June 15th, 2010

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Meeting Purpose

- Provide an update on the GO Transit Electrification Study progress to date
- Seek feedback on:
 - Rolling Stock Technology Assessment
 - Network Options
 - Proposed Approach for Further Assessment




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Agenda

- Welcome
- Opening Remarks - Metrolinx
- **Presentation:** *Rolling Stock Technology, Assessment, Network Options, and Approach for further Assessment – Delcan+Arup JV Team*
- **Working Session #1:** *Rolling Stock & Network Options*
- Break
- **Working Session #2:** *Approach for further Assessment*
- Closing Remarks and Next Steps
- Adjourn

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Karen Pitre
Study Project Director
Metrolinx



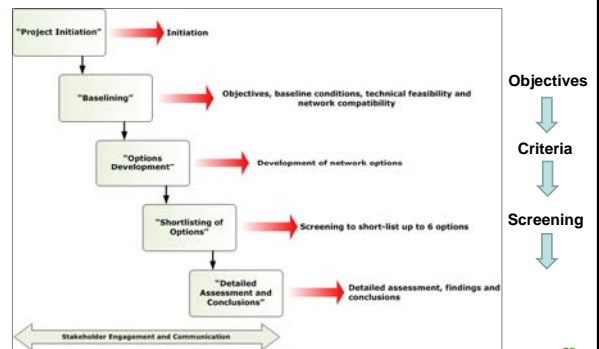
Stakeholder Workshop # 1 Review

- Study Approach
 - Objective
 - Comprehensive
 - Inclusive
 - Evidence Based
- Study Objectives
 - Study must address;
 - Technology, Capacity and Transit Service Impacts
 - Environment and Health
 - Community and Land Use
 - Economic
 - System Costs, Funding, Financing and Delivery

Update since last Stakeholder Workshop

- Stakeholder Consultation
 - Fall stakeholder workshop added
 - Reports have/will be circulated prior to workshops for review
 - Decision Making Framework
 - Draft 'Rolling Stock Technology Assessment' report
 - Baseline and Network Options reports
 - Early consultation (e.g. discussions on network options and study approach)
- Integrating Parallel Studies
 - Ongoing dialogue with study teams from the Interceptor Study, Georgetown South EA, and Union Station Capacity Study
- ARL is included in the Electrification Study

Study Approach Overview



Work Plan Overview

Phase	Time Period	Deliverable
Project Initiation	January	Work Plan Stakeholder Engagement and Communications Plan High Level Decision Making Framework
Baselining	January – June 2010	Evolving Baseline Report
Options Development	April – June 2010	Draft Rolling Stock Technology Report Draft Network Options Report
Short listing of options	July – September 2010	Draft Power Supply Technical Report Draft Interim Report
Detailed Assessment and Conclusions	September – December 2010	Final Report (December)



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Roger Wood Study Project Manager Delcan+ARUP JV



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Existing Trains on the Network



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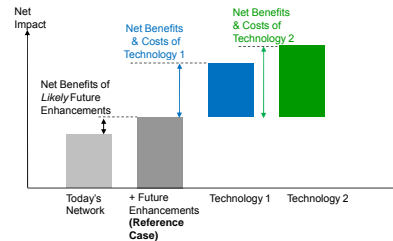


Reference Case Definition

- A scenario intended to represent:
 - Current rail service and rolling stock, *plus*
 - Committed schemes for which funding identified, *plus*
 - Other schemes advised by Metrolinx that might reasonably be expected to be implemented by 2021

Reference Case

- Basis for comparison of options
- Evaluate the incremental impacts of each technology

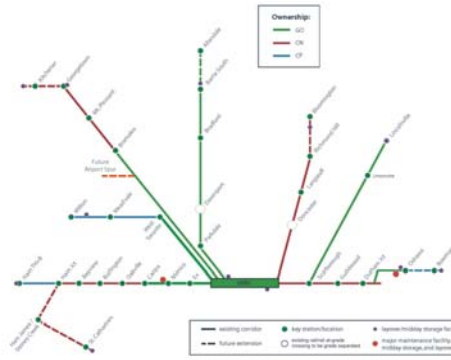


Reference Case – Rolling Stock

- MP40 Loco (Tier 4), 12 bi-level coaches, 2400 passenger carrying capacity



Reference Case - Infrastructure



Reference Case - Service Level

- Significant growth in train services, primarily in the counter peak and off-peak periods
- Peak hour service levels are limited by the maximum number of trains that can be accommodated at Union Station
- Generally per corridor:

Time of Day	Direction	Reference Case
Peak Period	Peak	More trains per hour
Peak Period	Counter-peak	Adds Hourly Service*
Off-Peak Period	Both	Adds Hourly Service*

* Adds Half-hourly on Lakeshore Line

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Technology Alternatives Rolling Stock



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Diesel

- Diesel Locomotive
 - MP40 (Tier 4)
 - Baseline for all technology comparisons
 - Hauls up to 12-car passenger cars



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Diesel

- Diesel Multiple Unit
 - Performance constant across consist lengths
 - Can split or combine trains
 - Single level - does not meet GO capacity requirements
 - Bi-level – technology not proven for required capacity, limited commercial technology



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Electric

► Electric Locomotive

- Compatible with current GO coaches
- Hauls 12-car trains
- Requires high-voltage overhead catenary



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Electric

► Electric Multiple Unit

- Performance constant across consist lengths
- Can split or combine trains
- Bi-Level - up to 16-car consists, meeting capacity
- Single-Level – does not meet GO capacity requirements



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Dual Mode

► Dual-Mode provides “one-seat ride” through electrified and non-electrified territory

- Dual-Mode Loco
 - In development
- Dual-Mode Multiple Unit
 - Bi-level does not exist



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Examples of Power Supply



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Alternate Fuel

- Biodiesel
 - Renewable fuel blendable with petro-diesel
 - Compatible with diesel options (LHC, DMU, Dual-mode) with little or no modifications to equipment
 - To date, several preliminary studies in locomotives
 - Engine warrantee coverage only with $\leq 20\%$ biodiesel
 - Not guaranteed to reduce emissions or carbon footprint
 - Can gel in cold winter temperatures

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Alternate Fuel

- Natural Gas (Compressed and Liquid)
 - Short range
 - Containment hazards
 - Mixed emissions
- Hydrogen Fuel
 - Difficult to produce and store
 - Significant danger during collision
 - Inefficient



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Hybrid Drive

- Experimental
- Expensive
- Beneficial for start-stop service



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Magnetic Concepts

- Maglev
- Inductive Power Transfer
- Ground-level Power Transfer
- Not compatible with existing infrastructure (track)



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Rolling Stock Technology Alternatives Comparison

	Technology Type	Proven Technology	Commercially Viable	Compatible with Reference Case Infrastructure	Compatible with Reference Case Service Levels
Single-level	Diesel LHC	Yes	Yes	Yes	No
	DMU	Yes	Yes	Yes	No
	Electric LHC	Yes	Yes	Yes	No
	EMU	Yes	Yes	Yes	No
	Dual Mode LHC	In development	Limited	Yes	No
	Dual Mode MU	Yes	Limited	Yes	No
Bi-level	Diesel LHC	Yes	Yes	Yes	Yes
	DMU	Limited	Limited	Yes	No
	Electric LHC	Yes	Yes	Yes	Yes
	EMU	Yes	Yes	Yes	Yes
	Dual Mode LHC	In development	Limited	Yes	Yes
	Dual Mode MU	No	No	Yes	Yes
	Biodiesel/ Natural Gas/ Hydrogen Fuel	Limited	No	Yes	Yes
	Hybrid	No	No	Yes	Yes
	Magnetic Concepts	No	No	No	No

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Rolling Stock Technology Alternatives Shortlist

- Diesel locomotive hauled trains
- Electric locomotive hauled trains
- Electric multiple unit trains
- Dual mode locomotive hauled trains

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Network Option Development

- **Technology alternative** - shortlisted alternative rolling stock technologies

Diesel Loco



Electric Loco



Dual Mode Loco



Electric Multiple Unit



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Network Option Development

- **Corridor alternative** – applies alternative rolling stock technology on any specific GO Transit line

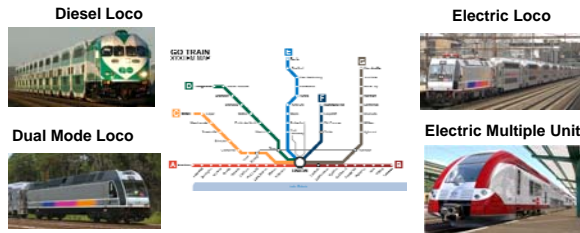


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Network Option Development

- **Network option** - applying alternative rolling stock technology on one or more of the seven GO Transit lines



Preliminary Pre-Screening Criteria for Generating Network Options

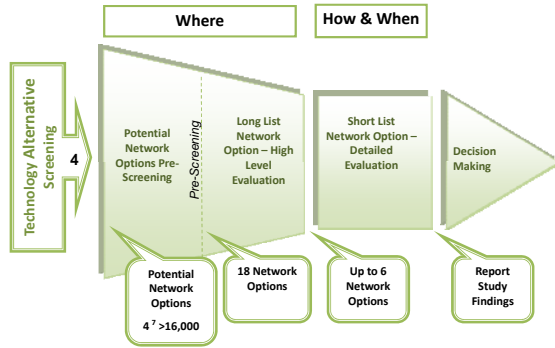
1. Electric Locomotive, Multiple Unit, and Dual Mode Loco are considered the same family of technologies
2. Lakeshore East and West to operate the same technology
3. Highest service/demand corridors

Applying Pre-Screening Criteria

Pre-Screening Criteria	Options Remaining
No pre-screening	16,384
1. Consider three technologies as a single family of electric trains at this stage	128
2. Lakeshore East and West to operate on the same technology	63
3. Prioritizing highest demand corridors	22
All pre-screening criteria combined	18



Option Progression



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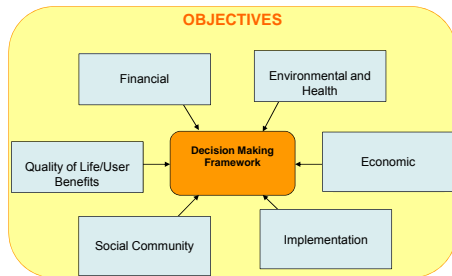
Further Assessment Of Options

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Evaluation Categories

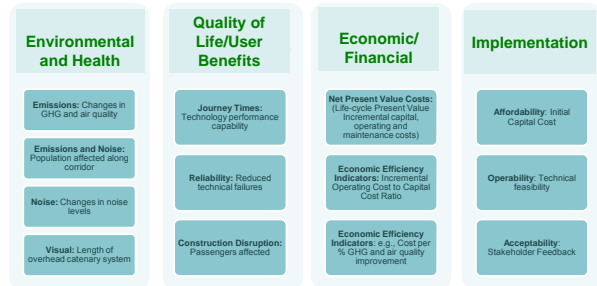


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Next Steps – Option Evaluation



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Next Steps in the Study

- Power Systems Alternatives
 - Overhead Catenary System / Third rail
- Infrastructure impacts
- Impacts along corridors
 - Health, noise, vibration, environment
- Financial implications
 - Capital and Operating



Study Timeline

Study Phase	Timeline												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Phase 1 - Project Initiation	█												
Phase 2 - Baselineing	█			★	█			★					
Phase 3 - Options Development													
Phase 4 - Shortlisting of Options													
Phase 5 - Detailed Assessment, Findings and Conclusions													

★ Stakeholder Workshop



Now time for discussion



Thank you!

Contact us at:
estudy@metrolinx.com

Electrification Study Website:
www.gotransit.com/estudy



APPENDIX B:

Question and Answer Period

GO Transit Electrification Study Stakeholder Workshop #2

June 21, 2010

Detailed Notes from Question & Answer Session:

Following welcoming remarks and the Study Team presentation, workshop attendees were given the opportunity to ask questions and provide comments (indicated by a 'Q' and 'C'). Answers, where provided, are indicated by an 'A'. Please note, questions are grouped by topic and do not appear in the order they were discussed.

Study Approach:

***Q1a:** You referred to the fact that Lakeshore would be the only line with half-hour service in 2021, however in the Georgetown South Environmental Assessment (EA) two of the three service scenarios showed the need for half-hour service in the Georgetown Line. The Georgetown line should also be included on your list of corridors with half hour GO service in 2021?*

***A1a:** The Electrification Study will only look at the medium term to understand the service levels for the purposes of this study. We are not looking past that. But, by looking at the levels for 2021 we will have a stable base for comparing the rolling stock technology options. The ARL is not part of the service case analysis for the purposes of this study because it will be managed by a different operator than GO Transit.*

***C2a:** If Metrolinx decided to build the new infrastructure required for electrification (e.g. substations, power supply systems, etc.) it should not be built to only meet the 2021 service levels. The system should be built to last for decades. As a result, the Electrification Study should look beyond 2021 to ensure it considers all necessary and relevant factors in the analysis and screening of technology and network options.*

***A2a:** One of the concerns with taking that long term approach for the purposes of this study is that the costs associated with electrifying the existing system will increase significantly. We are trying to find a balance between the long and short term. We wanted to ensure that we are comparing the technologies at a period in time that is reasonable, accounting for and addressing some of the existing service challenges of the network and accommodating for future growth.*

***C2b:** The infrastructure for an electrified system lasts for decades. In Pennsylvania an electrified system has been in operation for 70 years.*

***A2b:** One of our sub consultants, LTK, is based in the United States and knows that system well. As we mentioned previously, we are looking at the medium term. There is no question that the*

system needs to be adaptable so that it can be implemented in the short term and also be able to meet future service requirements.

Q3a: *All the other electrification studies have concluded that electrification is the best option for the future; however, the issue always comes down to money and political will. Are we looking at electrification seriously this time around?*

A3a: None of the previous studies addressed the constraints and challenges related to CN, CP, and Union Station. Electrification is a proven technology, but putting it on an existing network is very challenging. The ‘Rolling Stock Technology Assessment’ report was a balanced and objective look at the technology options for the GO network. As the study progresses, we will continue to ensure that the findings and conclusions are evidence based and objective. Moreover, we will continue to have an open and transparent process where you have the opportunity to give us feedback.

Assessment of the Rolling Stock Technologies:

Q4a: *What do you think about the potential opportunity of integrating two technological options? For example, you haven’t discussed the viability of using EMUs through the city and then connecting those consists to a diesel locomotive at the edge of the urban boundary.*

A4a: Utilizing that EMU option does pose some challenges for meeting existing passenger capacity requirements. Currently, GO runs consists with a capacity of 2400 passengers (seated and standing). The option you propose would also have to be discussed with the operators to fully understand the liability and safety issues that would need to be addressed for operating that type of system.

C5a: *GO should look beyond simply running 12 car consists on all lines at all times. There are examples around the world where cities have used different technologies to meet their service capacity.*

A5a: At this point we have not completed the operations portion of the study. We will look at various technologies to understand the most efficient way to meet service requirements across the network.

Q6a: *Aren’t the present locomotives a diesel and electric combination? Why can’t you just switch from one form of propulsion to another? Doesn’t it just require pulling along a gas tank with you or is it more complicated than that?*

A6a: The existing locomotives operate via electric motors that are powered through diesel generators. The existing locomotives cannot be converted in that manner because it is not possible to put two separate engines in one car body. It would add too much weight to the

locomotives. We have a report that will be circulated in the near future that will explain the power supply options for the technology options.

Q7a: *What evidence do you have that Tier 4 diesel technology will be available by 2021? Are there prototypes that have been developed?*

A7a: There is a commitment from GO that Tier 4 diesel technology will be used by 2021. Because Tier 4 will be a regulatory requirement in the United States, a number of companies are currently working on developing a prototype. We are currently in the process of obtaining further information related to costs and availability from a number of potential suppliers and will give you more information when it is available.

Q8a: *Considering the fact that GO currently operates Tier 2 technology, would it make sense to use Tier 2 locomotives as your base case?*

A8a: As mentioned previously, Tier 4 technology is planned to be implemented by 2021 across the GO network. The purpose for using Tier 4 technology in our reference case is that we want to get to a point where we can give Metrolinx enough information to do a thorough comparison of the technology options and make an informed decision. We will quantify the costs for changing the technology from Tier 2 to Tier 4 and include them in our analysis to ensure that balanced information is given to the Metrolinx Board.

Q9b: *What if a prototype or the costs related to changing the technology are not available by the time the study is complete?*

A9b: We have an ambitious timeline so if that information is not available by the time the study is complete than we will have to make some assumptions in our analysis. If that is required, we will ensure that those assumptions are available for you to review.

Network Options:

Q10a: *On the existing GO system map you referred to in your presentation some infrastructure proposed in long range planning documents such as the ‘Big Move’ are not included (e.g. Weston, Bloor, Bowmanville), why is this case?*

A10a: The map was used as a general representation of the infrastructure within the GO network. It is not intended to highlight all of the future stations in the GO network or what projects will be completed as part of the ‘Big Move’ plan.

Q10b: *In the future, the purpose for using this map should be made explicit to avoid confusion in the public. If you are going to outline future GO Transit projects on a map, ensure that all projects are included so that we can understand the implications of increased service and scheduling challenges related to future expansion in the network.*

A10b: We have made note of your comment. As I mentioned, the map was not intended to visually represent the future plans of GO Transit/Metrolinx. It was used to illustrate the fact that we are examining the infrastructure requirements within the network when comparing the impacts of the various rolling stock technology and network options.

Q11a: *The 2021 map in your presentation made no reference to a midtown connection to CP, was that intentional or something that was overlooked?*

A11a: That project is part of a long-term plan for the area and as a result is not part of our reference case.

Q10a: *There seems to be a lot of focus on whether a technology will be available in the future. However, there is a lower and upper bound number of trains per hour GO can operate with diesel technology. How does this relate to the study service levels on the various corridors?*

A10a: The system is constrained by the capacity of Union Station, not diesel technology. We need to address that reality first. This study is looking to highlight various opportunities and benefits related to the technology and network options presented here today.

Q14a: *If you operated a network with more than one technology on it (e.g. diesel and electric) how would you move electric trains to maintenance facilities located on a diesel line?*

A14a: That is an operational constraint. At the moment we don't know if all facilities can handle both diesel and electric or if new facilities will have to be built for electric trains.

Q14a: *In your presentation you mentioned that there would not be any trip time benefits associated with changing the rolling stock on the existing network. However, I have heard that GO could reduce trips on the Lakeshore line by nine minutes. If there are service level needs that cannot be met by diesel technology is GO obligated to adopt an alternative technology to address that issue?*

A14a: The reference case service levels are based on medium term planning projections so that we have a level playing field for comparing diesel and electric technology. As service levels increase more trains will be needed to meet demand. Understanding those dynamics is the next part of our analysis and when we have that information we will forward it along to you.

Screening Approach:

C15a: *It would be useful to publish your assumptions so that we can understand how you have narrowed down the various network options. If you change your assumptions it changes the viability of different network options and influences which corridors get upgrades first.*

A15a: Those assumptions will be coming shortly.

Screening Criteria and Comparison:

C16a: *It is important to note that the Study Team will not prepare formal recommendation and a business case for GO. This exercise is a study that will outline a number of models and case studies that will then be used by the Metrolinx Board. If the results are not what we are looking for or if the current political, economic, or social conditions change, we can rework what has been done. This is just one input into the decision making process.*

C17a: *Are you going to screen out and weight the objectives? Is that the next step of the study?*

A17a: As mentioned, this study will not make any recommendations. Consequently, we will provide the board of directors with objective, evidence based findings and conclusions so that they can make an informed decision.

Operations and Planning:

C18a: *If we don't achieve the level of service outlined in the 'Big Move' I am concerned about community backlash. The 'Big Move' needs to be reworked so that it references realistic infrastructure targets.*

A18a: The 'Big Move' looked at a snapshot in time. You may be correct that some adjustments should be made, especially considering the current economic climate. We are gathering a tremendous amount of information for the Electrification Study that will assist Metrolinx in understanding the viability of the targets outlined in the 'Big Move'.

APPENDIX C:

Sample Worksheet



**GO Transit Electrification Study
Stakeholder Workshop #1**

WORKSHEET

Please Print

Name (optional)

Email (optional)

Phone Number (optional)

Working Session 1: Rolling Stock Technology Assessment and Network Options

1. What feedback do you have on the preliminary assessment of rolling stock technologies?

2. What feedback do you have on the preliminary network options presented by the Study Team?

Working Session 2: Proposed Approach for Further Assessment of Options

- 1. What feedback do you have on the Study Team’s proposed approach for further assessment of technologies and network options?*

Do you have any additional comments or questions regarding the GO Transit Electrification Study?

For further information about this project, please contact:

Karen Pitre
Study Project Director
Electrification Study
Karen.Pitre@metrolinx.com

APPENDIX D:

Submitted Group Worksheets

Group 1 - Breakout Discussion Worksheet

Working Session 1: Rolling Stock Technology Assessment and Network Options

1. What feedback do you have on the preliminary assessment of rolling stock technologies?

-phasing strategy – connect one technology with another at the edge of a network → e.g. electric to connect to diesel locomotives

2. What Feedback do you have on the preliminary network options presented by the Study Team?

-look at the viability of short line feeders → this may lower costs of extensions/improvements

Working Session 2: Proposed Approach for Further Assessment of Options

1. What feedback do you have on the Study Team's proposed approach for further assessment of technologies and network options?

-how do you power a full electric system?

-how will this study connect to city plans and policies and other social objectives/benefits?

-consider what will happen with additional stations in the system

-consider various health effects of each technology option = cost to health system of diesel vs. Electric (e.g. respiratory diseases)

-cost of GHG emissions

-How well integrated will this part of the study be with capacity at Union Station?

-consider long-term employment numbers

-renewable energy sources should be used to power this system

-how will the technology options effect land development?

-need counter-peak service to be higher to support different development and movement = employment in outlying areas should connect to city centres such as Markham.

-what is will be used to evaluate the costs associated with economics and health?

Do you have any additional comments or questions regarding the GO Transit Electrification Study?

-Board members should attend these meetings

Group 2 - Breakout Discussion Worksheet

Working Session 1: Rolling Stock Technology Assessment and Network Options

1. What feedback do you have on the preliminary assessment of rolling stock technologies?

- Both Tier 2 and Tier 4 diesel technology should be included in the assessment of technology options
- Risk assessments should be conducted for Tier 2 and Tier 4 technology
- The ARL should be electrified immediately; the public needs answers and that process should become more transparent
- The public should have increased information regarding the ARL agreement to understand options that are currently being discussed
- The Electrification Study needs more information about the ARL to understand the impacts for electrification (i.e. are they protecting for future electrification)

2. What Feedback do you have on the preliminary network options presented by the Study Team?

- there was nothing to discuss, stakeholder need to know what assumptions have been made related to network options to screen the technologies
- the study team should examine the opportunity of through routing GO lines to increase efficiency
- examine the potential viability of having all lines going into Toronto stop at Bloor and integrate with transit operators
- look past 2021 for understanding cost recovery and service levels. If you only look to 2021 cost recovery will be too low. This approach contradicts the Province's approach on other investment initiatives. The roll out plan for electrification should look further ahead than 2021.

Working Session 2: Proposed Approach for Further Assessment of Options

1. What feedback do you have on the Study Team's proposed approach for further assessment of technologies and network options?

- user benefits will improve and build the case for electric vs. Diesel
- prioritize sustainable energy
- conduct sensitivity analysis for energy costs
- look at other case studies to examine the historical impact of electrification on other areas → i.e. look at land use implications

Do you have any additional comments or questions regarding the GO Transit Electrification Study?

N/A

APPENDIX E:

Submitted Individual Worksheets

*** Note: Personal information submitted on worksheets was removed***

Individual Worksheet 1

Working Session 1: Rolling Stock Technology Assessment and Network Options

1. What feedback do you have on the preliminary assessment of rolling stock technologies?

N/A

2. What Feedback do you have on the preliminary network options presented by the Study Team?

N/A

Working Session 2: Proposed Approach for Further Assessment of Options

1. What feedback do you have on the Study Team’s proposed approach for further assessment of technologies and network options?

- When comparing the financial costs of the different options we need to make assumptions about cost of green house gas emissions, either in carbon tax or under the cap and trade system. Regardless of the pricing scheme, green house gas emissions are going to be an operating cost by 2021 or 2031.

Do you have any additional comments or questions regarding the GO Transit Electrification Study?

N/A

Individual Worksheet 2

Working Session 1: Rolling Stock Technology Assessment and Network Options

1. What feedback do you have on the preliminary assessment of rolling stock technologies?

-An EMU meeting a diesel locomotive at the end of the electrified part of the corridor. If the consists are longer than what the locomotive can pull, the diesel locomotive does not have to pull the whole consists as the capacity of 12 cars is not needed for the last couple of stations. This approach can reduce the costs of catenary infrastructure.

2. What Feedback do you have on the preliminary network options presented by the Study Team?

-What impacts does additional stations added to existing corridors, and how does it align with planning and growth policies.
-Do not evaluate corridors as all or nothing; it isn't necessarily a problem if Lisgar to Milton is diesel as long as Mississauga & Toronto are electric.

Working Session 2: Proposed Approach for Further Assessment of Options

1. What feedback do you have on the Study Team's proposed approach for further assessment of technologies and network options?

- Break up network info into two categories: Urban and Rural
-Break down options within single corridors
-More reverse peak service is needed to encourage growth in urban growth centres from an employment lens. Hourly service will not meet the growth objectives.

Do you have any additional comments or questions regarding the GO Transit Electrification Study?

-Do not believe everything GO Transit staff tell you. Look at how other operations work. Two great examples from Tokyo include Odakyu Electric Railway and Keikyu Electric Railway.

Individual Worksheet 3

Working Session 1: Rolling Stock Technology Assessment and Network Options

1. What feedback do you have on the preliminary assessment of rolling stock technologies?

N/A

2. What Feedback do you have on the preliminary network options presented by the Study Team?

N/A

Working Session 2: Proposed Approach for Further Assessment of Options

1. What feedback do you have on the Study Team’s proposed approach for further assessment of technologies and network options?

- Not enough detail has been provided to date to provide proper feedback on the proposed approach. In particular, the decision-making framework has not been made public. Given that decision-making will be in the hands of the Metrolinx Board, it is particularly important to know if and how much guidance they will be given.

Do you have any additional comments or questions regarding the GO Transit Electrification Study?

N/A

Individual Worksheet 4

Working Session 1: Rolling Stock Technology Assessment and Network Options

1. What feedback do you have on the preliminary assessment of rolling stock technologies?

N/A

2. What Feedback do you have on the preliminary network options presented by the Study Team?

N/A

Working Session 2: Proposed Approach for Further Assessment of Options

1. What feedback do you have on the Study Team’s proposed approach for further assessment of technologies and network options?

- N/A

Do you have any additional comments or questions regarding the GO Transit Electrification Study?

-If the ARL is a DMU all hell will break loose on the corridor all the way down to Union Station.

Individual Worksheet 5

Working Session 1: Rolling Stock Technology Assessment and Network Options

1. What feedback do you have on the preliminary assessment of rolling stock technologies?

N/A

2. What Feedback do you have on the preliminary network options presented by the Study Team?

N/A

Working Session 2: Proposed Approach for Further Assessment of Options

1. What feedback do you have on the Study Team's proposed approach for further assessment of technologies and network options?

- N/A

Do you have any additional comments or questions regarding the GO Transit Electrification Study?

-More transparency on the ARL please! Other than that, great workshop!

APPENDIX F:

Workshop Invitation and Attendance List

**GO Transit Electrification Study
Stakeholder Workshop #2 Invitation and Attendance List
Tuesday, June 15, 2010**

* Bolded Organizations Attended Stakeholder Workshop #2

Environment & Health

Pollution Probe

Air and Waste Management Association

Toronto Board of Health

CommunityAIR

Ontario Agency for Health Protection and Promotion

Clinton Climate Initiative

Environmental Health Association

ESEI Solar Foundation

Clean Air Partnership

Rouge Park Alliance

Ontario Healthy Communities Coalition

Ontario Clean Air Alliance

Wellesley Institute

Pembina Institute

Ontario Lung Association

Evergreen

Green Communities Canada

Canadian Association of Physicians for the Environment

Conservation Council of Ontario

Friends of the Greenbelt Association

Ontario Public Health Association

Protect Our Water and Environmental Resources

Community

Toronto City Summit Alliance

Weston Village Residents' Association

Weston Community Coalition

Mount Dennis Community Association

Canadian Federation of Students (Ontario)

Lakeview Ratepayers Association

Metroland Media Group

Member of GO Transit Community Advisory Committee

Centre for Social Innovation

Active Living Alliance for Canadians with a Disability

Center for Information and Community Services of Ontario

Community Living Ontario

Housing Action Now

Ontario Community Support Association

Ontario Council of Agencies Serving Immigrants

Safe Kids Canada

Ontario Heritage

Metrolinx Seniors Advisory Committee

Ontario Undergraduate Student Alliance

Land Use and Social Planning

People Plan Toronto
Sustainable Urban Development Association
Canadian Urban Institute
Ontario Smart Growth Network
Ontario Professional Planners' Institute
pAlliance
Ontario Association of Landscape Architects
Urban Land Institute
Building Industry and Land Development Association
Canadian Policy Research Networks
Ontario Association of Architects
Ontario Federation of Agriculture
Ontario Professional Engineers Association
Neptis Foundation

Transportation Advocacy and Commuter Groups

BA Group

Clean Train Coalition

Regional Transit Advocate

Transit Riders Advocacy Coalition (GTHA)

GO Transit Customer Service Advisory Committee
Healthy Transport Consulting
Canadian Automobile Association (CAA)
Ontario Public Transit Association
Canadian Urban Transit Association
Transport 2000 Ontario
Smart Commute
Centre for Sustainable Transportation
Ontario Good Roads Association
Disabled and Aged Regional Transit
Canadian Institute of Transportation Engineers

Business and Economic Development

Greater Toronto Airports Authority (GTAA)
FRAM Building Group
The Warren Group
Green Tourism Association
Ontario Agri Business Association
Ontario BIA Association
Ontario Environmental Industry Association
Ontario Restaurant, Hotel, Motel Association
Ontario Tourism & Ontario Tourism Marketing Partnership
Retail Council of Canada
C.D. Howe Institute
The Institute for Competitiveness & Prosperity
BOMA Canada
Ontario Chamber of Commerce
Small Business Association - Canada
Canadian Youth Business Foundation (CYBF)
Toronto Board of Trade
Toronto Association of BIAs
Canadian Federation of Independent Business
Ontario Home Builders Association
Ontario Real Estate Association
Canada Green Building Council, Greater Toronto Chapter

Academic

University of Toronto (2)

McMaster University

Humber College (School of Applied Technology)

Mohawk College of Applied Arts and Technology

Sheridan College Institute of Technology and Advanced Learning

Ryerson University, School of Urban & Regional Planning

Gage Occupational and Environmental Health Unit – University of Toronto

Ontario College of Art & Design

Seneca College of Applied Arts and Technology

University of Ontario Institute of Technology

University of Toronto at Scarborough

York University